

WHAT WE CLAIM ARE:

1. A device comprising:
  - an underlying body having a non-orientated first surface;
  - a lower electrode formed on the first surface of said underlying body, said lower electrode containing conductive metal oxide and not containing noble metal, the conductive metal oxide having a (0 0 1) orientated  $\text{ABO}_3$  type perovskite structure;
  - a ferroelectric layer formed on said lower electrode, having a rhombohedral  $\text{ABO}_3$  type perovskite structure, said ferroelectric layer being orientated in conformity with the orientation of said lower electrode; and
  - an upper electrode formed on said ferroelectric layer.
2. A device according to claim 1, wherein the conductive metal oxide essentially consists of  $\text{LaNiO}_3$ .  
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3. A device according to claim 2, wherein the conductive metal oxide contains alkali earth metal as additive.
4. A device according to claim 3, wherein the alkali earth metal is Sr.  
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5. A device according to claim 1, wherein the first surface is of a polycrystalline phase.
6. A device according to claim 1, wherein the first surface is of an amorphous phase.  
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7. A device according to claim 6, wherein the first surface is made of silicon oxide or silicon nitride.

5 8. A device according to claim 1, wherein said ferroelectric layer essentially consists of  $PbZr_xTi_{1-x}O_3$  ( $0.52 < x \leq 1.0$ ).

9. A device according to claim 8, wherein said ferroelectric layer contains as additive at least one element selected from a group consisting of La, Ca, Sr and

10 Ba.

10. A device according to claim 1, wherein said ferroelectric layer is (0 0 1) orientated.

15 11. A device according to claim 1, wherein said underlying body comprises:

a silicon substrate;

a MOS transistor formed on said silicon substrate;

a first interlayer insulating film formed on said silicon substrate and covering said MOS transistor; and

20 a conductive plug formed through said first interlayer insulating film and connected to said MOS transistor, wherein  
said upper or lower electrode is connected to said conductive plug.

12. A device according to claim 11, further comprising a second interlayer insulating film formed on said first interlayer insulating film and covering a

ferroelectric capacitor constituted of said upper electrode, said ferroelectric layer and said lower electrode, wherein said lower electrode is formed on said first interlayer insulating film and connected to said conductive plug.

5 13. A device according to claim 11, further comprising:

a second interlayer insulating film formed on said first interlayer insulating film and covering a ferroelectric capacitor constituted of said upper electrode, said ferroelectric layer and said lower electrode;

10 interconnect conductive plugs formed through or in said second interlayer insulating and reaching said upper electrode, said lower electrode and said conductive plug; and

wiring lines formed on said second interlayer insulating layer and connected to said interconnect conductive plugs.

15 14. A device according to claim 1, wherein said lower electrode, said ferroelectric layer and said upper electrode are patterned to collectively form a bulk acoustic wave element.

15. A device according to claim 1, wherein said lower electrode and said 20 ferroelectric layer extend in a broad area and said upper electrode is patterned above said lower electrode and said ferroelectric layer to collectively form a surface acoustic wave element.

16. A method of manufacturing a device having a capacitor element, comprising 25 steps of:

(a) forming a conductive metal oxide layer on an underlying body having a non-orientated surface, said conductive metal oxide layer having a (0 0 1) orientated  $\text{ABO}_3$  type perovskite structure;

(b) forming a ferroelectric layer on said conductive metal oxide layer, said ferroelectric layer having a (0 0 1) orientated rhombohedral  $\text{ABO}_3$  type perovskite structure; and

(c) forming an upper electrode on said ferroelectric layer.

17. A method of manufacturing a device having a capacitor element according to claim 16, wherein said step (a) includes a step of heating the underlying body at 500 to 800 °C in an oxygen-containing atmosphere.

18. A method of manufacturing a device having a capacitor element according to claim 17, wherein said step (a) performs said heating step after sol-gel source material liquid is coated and solvent is evaporated.

19. A method of manufacturing a device having a capacitor element according to claim 18, wherein the sol-gel source material liquid contains  $\text{La}(\text{NO}_3)_6 \cdot 6\text{H}_2\text{O}$  and  $\text{Ni}(\text{CH}_3\text{COO})_2 \cdot 4\text{H}_2\text{O}$  added with 2-methoxyethanol.

20. A method of manufacturing a device having a capacitor element according to claim 17, wherein said step (a) performs said heating step after said conductive metal oxide layer is formed by pulse laser deposition (PLD).